National Institute of Environmental Health Sciences

Climate change and environmental injustice in a bi-national context

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Abstract:

Few studies have taken a conventional quantitative environmental justice approach to assessing the inequitable implications of climate change at a fine scale, such as across neighborhoods within an urban area. In this paper, we test the "environmental justice hypothesis" for climate change-related variables in the bi-national context of El Paso, Texas and Ciudad Juarez, Chihuahua using a matched set of social indicators from the 2000 US and Mexican censuses and biophysical data related to heat, ozone and flooding. T-test results demonstrated that social marginality and climate change-related hazard exposure were generally higher in Juarez as compared to El Paso. Using spatial regression models, we found patterns of environmental injustice in the sister cities related to these climate change-related hazards. Lower social class neighborhoods generally faced increased risks from extreme heat in both cities, and from floods and peak ozone in El Paso. In El Paso, children also faced significant and disproportionate exposure to peak ozone, while female-headed households were significantly more burdened by flooding and peak ozone in Juarez. Despite the limitations of this cross-sectional study, we can expect injustices to heighten as neighborhoods at-risk now become increasingly exposed under climate change scenarios. In sum, this analysis provides a model for investigating inequities associated with future small area impacts of climate change.

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Resource Description

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Extreme Weather Event, Temperature

Air Pollution: Ozone

Extreme Weather Event: Flooding

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location:

resource focuses on specific location

Non-United States, United States

Non-United States: Non-U.S. North America

Health Impact:

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology:

type of model used or methodology development is a focus of resource

Exposure Change Prediction

Population of Concern: A focus of content

Population of Concern:

populations at particular risk or vulnerability to climate change impacts

Low Socioeconomic Status

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content